

American Trainco - Over 100,000 Satisfied Students

Limited Seating

Understanding & Troubleshooting

# PLCs for Non-Programmers™

Designed to take the mystery out of working with Programmable Logic Controllers

For a schedule of open enrollment classes or to bring this training to your plant or facility, contact us @

1-877-97-TRAIN

www.AmericanTrainco.com

An Introductory Course Created Specifically for Maintenance Personnel and Electricians Working in Industrial Plants, Public Facilities and Commercial Buildings

College Credit & Testing Available with this Course

This course now carries American Council on Education (ACE) College Credit Recommendations.

“...very understandable and easy to follow...”

Jimmy Larson – Electrician – SST Energy



ATTEND THIS SEMINAR AND LEARN TO:

- Speak the PLC Language
- Read and Interpret PLC Ladder Logic
- Troubleshoot PLC systems and components
- Relate PLC programming to "real world" applications
- Fix PLC problems on your own....

.....before calling an outside service contractor!

- This seminar can also be presented at your facility for larger groups
- Reserve Your Space Now! **CALL 1-877-97-TRAIN**

Or check us out online at [www.AmericanTrainco.com](http://www.AmericanTrainco.com) for a complete listing of all seminars coming to your area

Ideal for workers in Multi-craft Environments

Real World Training...for Real World Needs™

Understanding & Troubleshooting

# PLCs for Non-Programmers™

Designed to take the mystery out of working with Programmable Logic Controllers

▶ *"...interesting and fun!"*

Dan Dorhan – Plant Operator – Winter Park Water & Saitation

▶ *"...detailed - but easy to understand"*

Robert Bostick – Journeyman Electrician – Basic Energy Services

## PURPOSE OF TRAINING

This seminar converts the seemingly complex world of PLC's into practical, down to earth knowledge the average maintenance person can understand. We've taken the very best information from top manufacturers, boiled it down into basic common practices and principles, and applied our unique teaching philosophy to give you simple, clear and concise instructions on how to work with just about any Programmable Logic Controller. This course is perfect for multi-craft maintenance technicians, electricians, or other non-programmers who want to be able to speak the PLC language, read and interpret PLC ladder logic, troubleshoot PLC systems and components, and be able to fix common PLC problems on their own. At the end of this seminar students will be able to go back to their workplace and immediately apply what they have learned. Now that's "Real World" training!

## TRAINING OUTCOMES

Upon completion of this course, students will receive a training certificate and 1.6 Continuing Education Units indicating that the student has learned to:

- Identify PLC components
- Read and interpret Ladder Logic
- Understand function and purpose of basic programming instructions
- Configure a PLC based control system
- Relate actual PLC instructions to "real world" applications
- Troubleshoot & correct PLC problems by identifying & isolating the most common system faults.

And to be 100% certain you get the training you need, students are encouraged to bring PLC diagrams or case studies on problems from their own facility! If you have a unique situation, just let our instructor know. If he can't help you with your specific problem, we'll refund your money – guaranteed!

## TEACHING PHILOSOPHY

"Real World Training...for Real World Needs", is not just our slogan, but also our mission statement. At American Trainco, we approach our students as if they were our own employees. We instruct and guide them in practical knowledge that allows them to immediately go back to their workplace and apply what they have learned. Our instructors are seasoned veterans with years of real world experience, and the students who attend our seminars often get more from a few days of training than an entire year of reading textbooks or watching videos. How do we know? They tell us.

Anyone can teach theory, but there simply is no substitution for experience. What sets American Trainco apart is our ability to communicate that experience to our students. As one attendee told us at the end of his two-day training course, "I think I can go back to work now and teach the veterans a thing or two."

Mission accomplished.

## ABOUT OUR INSTRUCTORS

All American Trainco instructors are required to have a formal education and real world work experience. They need to be leaders in their field. We don't hire field people without teaching experience, and we don't hire teachers without field experience. They must have both. And since attendees critique the instructor at the end of each class, a positive and enjoyable learning experience is virtually guaranteed.

## CERTIFICATES-TESTING-COLLEGE CREDIT

After completion of this seminar students will receive a Certificate of Completion and 1.6 CEUs (Continuing Education Units) approved by the Maintenance Training Association of the Americas. Students may also elect to take the MTAA Certification test associated with this topic. Those seeking college credit recommendations must attend both days of this course and successfully pass the MTAA Certification test. This course is recommended by ACE for 1 college credit hour. Transcripts are available through American Trainco.

## UNAFFILIATED and NON-COMMERCIAL

Unlike some training experiences, you won't get a sales presentation at an American Trainco seminar – all you get is an honest, commercially unbiased education. We do not engage in the practice of selling or promoting any other company's products or services, so you know that by attending one of our seminars, your time and money is well spent.

## HIGH QUALITY PRESENTATIONS

Black and white transparencies never made it in the door at American Trainco. From the start we demanded that all our presentations would be lively, attractive, crisp and clear. Our instructors use state-of-the-art computers, projection equipment and software to bring you a high quality visual experience. And our books are designed with the student in mind too. We know that they don't always have a lot of time to read volumes of literature so our manuals are quick and to the point, providing attendees the same charts, descriptions, pictures and bulleted items they'll see during the instructor's presentation.

## OTHER SEMINARS

American Trainco presents a variety of maintenance training seminars throughout the country on a regular basis. Contact us to find out more about the training courses coming to your area, including:

- Basic Electricity for the Non-Electrician™
- Electrical Troubleshooting
- Air Conditioning & Refrigeration
- Boiler Operation, Maintenance & Safety™
- Arc Flash Protection & Electrical Safety™
- 2011 National Electrical Code®

And 20+ other courses in the following areas:

- Electrical / Electrical Controls
- HVACR
- Mechanical
- Facility & Plant Management
- Fluid Power
- Pumps / Piping
- Codes / Standards / Safety

Reserve Your Space Now! **CALL 1-877-97-TRAIN** Or Online at: **www.AmericanTrainco.com**

# C O U R S E O V E R V I E W

Studies have indicated that 80% of the faults associated with a PLC based control system involve either I/O (Input/Output) devices or field wiring. So during this seminar you will learn how to use both hardware and software to find these faults quickly. Students will learn how to use a systematic approach to troubleshooting; how to set-up and configure local, remote, hierarchical and distributive control systems; how to configure Input/Output modules using various slot addressing techniques; what to understand about program and data table file organization, number systems and processor information flow; and how basic relay type instructions, timers and counters, and data manipulation instructions can be used to achieve the PLC solution you want.

The other remaining 20% of faults can also be quickly found using software tools that usually remain hidden to all but the most experienced troubleshooting professional. But in this American Trainco seminar we will unlock these tools, dispel the myths and provide you aids that you can take back to your workplace for easy future reference. At American Trainco, we provide real world training for your real world needs!

## I. Speaking the Language of PLCs

### A. Hardware Focus

### B. How PLC's Work

1. Past
2. Present
3. Future

### C. PLC Terminology

### D. Parts of a PLC

1. Input Interfaces
2. Processor
3. Output Interfaces
4. Power Supplies
5. Programming Terminals

### E. System Configurations

1. Local
2. Remote
3. Hierarchical
4. Distributive

### F. Hardware Considerations

1. Field Wiring
2. Master Control Relay
3. Isolation Transformers
4. Four Basic Types of Grounding

## II. Reading PLC Ladder Logic

### A. Organization and Function

### B. Data Table Organization

1. Numbering Systems
2. Data Table Files
3. Bit, Word and File Addressing

### C. Introduction to Programming

### D. Common PLC Instructions

1. Basic Relay
2. Counters and Timers
3. Data Transfer

## E. Organization

1. Subroutine Files
2. Selectable Timed Interrupt (STI) Files
3. Jumps and MCR Instructions
4. Fault Routines

## F. Relating the PLC to "Real World" Applications

## III. Troubleshooting Systems & Components

### A. Safety

### B. Forcing of Input Data Table & Output Devices

### C. Identifying I/O Field Device Faults

### D. Identifying I/O Module Faults

### E. Identifying System Faults

### F. Using the Data Monitor Screen

### G. Using the Processor Status and I/O Status Screen

## IV. Find and Fix the 10 most Common PLC Problems

### A. The "Ultimate PLC Troubleshooting Flowchart"

### B. Using Troubleshooting Tools

### C. Using Software Tools

### D. "Real World" Case Studies

## SEMINAR AGENDA

7:30 am	Registration
8:00 am	Class Begins
12:00 - 1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

## SEMINAR FEES

\$990 Both Days

## NO RISK REGISTRATION & MONEY-BACK GUARANTEE

If you're not sure you'll be able to attend this seminar, you can still make a reservation to hold your space in class. While payment is due prior to the start of the seminar, you may choose a full refund or credit for cancellations made at least 24 hours in advance. Student substitutions can also be freely made at any time prior to the start of the seminar. Refunds will not be issued for registered attendees who fail to show up and have not given a notice of cancellation. In the rare event that you do not receive the expected value after attending our seminar, simply notify us in writing of your reasons and your money will be promptly refunded.

## IN-HOUSE TRAINING

You can bring this or any other maintenance training program directly to your facility. Simply give us a call, tell us what you're looking for, and we'll provide you a quote. We also provide custom training for courses not listed in this brochure.

Call **1-877-97-TRAIN** and ask for Dan or Adam, or email [AdamC@AmericanTrainco.com](mailto:AdamC@AmericanTrainco.com). Visit us on the web at [www.AmericanTrainco.com](http://www.AmericanTrainco.com)

Reserve Your Space Now!

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▶ **"Left with 'zero' questions... answered them all. I strongly recommend!"**

Lorenzo Razo – Journeyman Electrician – Hill AFB

▶ **"Excellent class and very unique!"**

Chuck Kvenvold – Maint. Mechanic  
– The Dannon Company

Check:

- Interconnect cables
- Power supplies
- Reseat / replace remote Communication modules

▶ **"Clear & concise (for) real life applications."**

Steve Olson - Eng Tech  
– Cargill Deicing Technology

Real World Training...for Real World Needs™

**AT**  
AMERICAN TRAINCO

# REGISTRATION

Understanding & Troubleshooting

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**"This was a huge bang for the buck!"**

David Younker  
Aetna Bearing Company

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**SEMINAR FEE**  
**\$990 Both Days**

**FIVE EASY WAYS TO REGISTER:**

- 1) **Internet** www.AmericanTrainco.com
- 2) **Fax** (303) 531-4565
- 3) **Phone** Toll Free 1-877-97-TRAIN 1-877-978-7246 or (303) 531-4560
- 4) **Mail** this form to: American Trainco, Inc. P.O. Box 3397 Englewood, CO 80155
- 5) **E-mail** the information requested on this form to: Sales@AmericanTrainco.com

**Authorizing Person/Supervisor:** Name \_\_\_\_\_

Title \_\_\_\_\_ Company Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ Email \_\_\_\_\_

Seminar Attendees:	Name	Title	E-Mail	Seminar City

**Billing Information:** (Please fill out this section only if the "Bill To" name and address is different than the Authorizing Person's name and address above.)

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PROMOTION CODE

**X05**